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RESEARCH ARTICLE

# Redescription of *Apseudopsis arguinensis* (Crustacea: Peracarida: Tanaidacea) from the Coast of Mauritania

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## Abstract

In addition to those described by Guțu (2002), the female with eggs of the species *Apseudopsis arguinensis* is redescribed in detail. Also, some remarks on male morphology are presented.

### Keywords

Tanaidacea, Apseudomorpha, Apseudidae, *Apseudopsis arguinensis*, Coast of Mauritania.

## Introduction

In a study concerning the genus *Apseudes* Leach, 1814 from the Mediterranean basin and North African Atlantic, Guțu (2002) reestablished the state of several species and described ("preliminary", as he mentioned himself in the introduction part) six new species for which he presented only a diagnosis and a few drawings, without referring to the morphology of mouthparts and pereopods 2–6, except the basis of pereopod 5 of the species *A. hastifrons* Norman and Stebbing, 1886.

In 2006, Guțu revalidated the genus *Apseudopsis* Norman, 1899, synonymized by Lang (1955) with *Apseudes*, adding at the new diagnosis some essential morphological features, unnoticed by Norman (1899). Within this context, a part of the species classified in the genus *Apseudes*, including those described by him (Guțu 2002), were transferred to the genus *Apseudopsis*.

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PENSOFT.

Because the brief descriptions can generate serious difficulties in establishing the identity of some species, I thought it was appropriate to redescribe, at least some of the species incompletely described, based on the type material deposited in the collections of "Grigore Antipa" National Museum of Natural History. Further on, I'll present, in the beginning, the detailed redescription of the adult female of *Apseudopsis arguinensis* (Guțu, 2002), from Mauritania.

## Material and methods

The material used to redescribe the species, preserved in alcohol 70%, comes from a lot of over 120 specimens, collected from the same place and time with the type material and deposited in the collection of "Grigore Antipa" Museum with No. 250.208. Dissections were made using a CARL ZEISS SM-XX CMO Citoplast stereomicroscope, on several females with eggs, taken randomly, and one male. For illustrations, I used the best slides, of a single female and male, mounted on temporary slides in five parts of alcohol 70% and one part of glycerin. The observations were made with an Olympus CX 21 microscope, and the drawings were made with a camera lucida.

The morphological terminology follows, mostly, that proposed by Larsen (2003). For cuticular formations (spines and various types of setae, etc.) I used the terminology proposed by Bamber and Sheader (2005) and Błażewicz-Paszkowycz and Bamber (2007), and for what Larsen (op. cit.) named "setal row" in the case of mandibles, I adopted the term "setiferous lobe" (cf. Guțu 2006). Because several authors used different terms ("unguis", "distal tooth", "distal claw", "terminal spine", "terminal claw" or only "claw") for the "terminal parts" of the chela (with reference to the fixed finger and dactylus) and the "terminal part" of pereopods 1–6 dactylus, I adopted the term "claw" for the chela (since there is only one claw, always situated terminally) and "unguis" for pereopods.

### *Apseudopsis arguinensis* (Guțu, 2002)

*Redescription of female with eggs:*

*Body* (Fig. 1A) dorsoventrally flattened, approximately 6.15 times as long as wide; length about 7 mm.

*Cephalothorax* (including rostrum) about as long as wide, equal with the length of the first two pereonites combined. Rostrum pointed, relatively short and broad at base. Eyelobes present, each with a spine-like process; eyes pigmented (detail, fig. 1A).

*Pereon* about 3.6 times longer than carapace and 2.3 times longer than the pleon; all pereonites much wider than long, slightly decreased in width from the first pereonite to the last one. Pereonites 1–6 respectively about 0.39, 0.48, 0.66, 0.73, 0.65 and 0.5 times as long as wide; first pereonite widest, fourth pereonite longest. Pereonites 2–6 with 11–17 simple setae on the anterolateral corners and other four

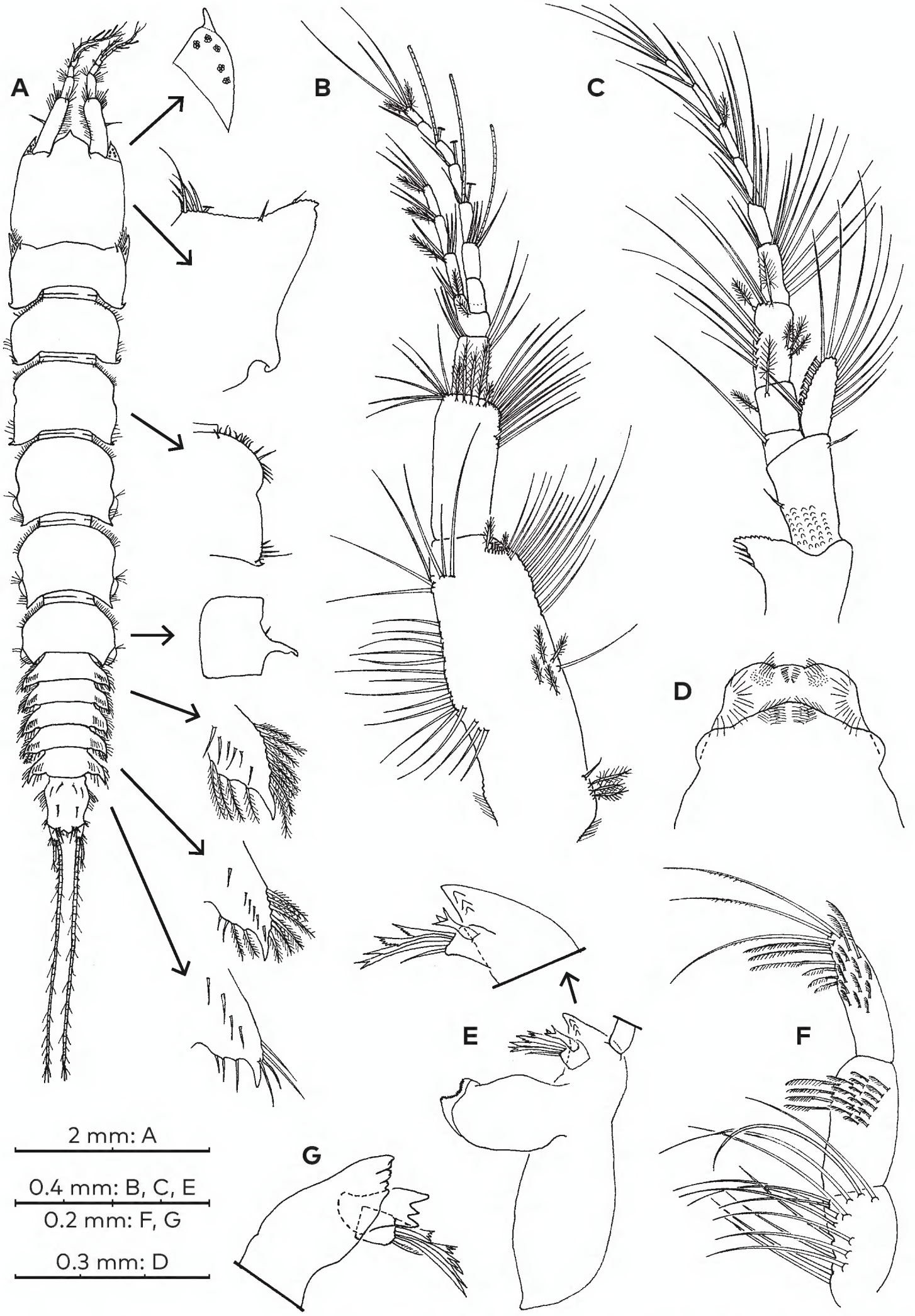


**Figure 1.** *Apseudopsis arguinensis*, female: **A** body, dorsally; **B** antennule; **C** antenna; **D** labrum; **E** right mandible; **F** palp of right mandible; **G** pars incisiva, lacinia mobilis and setiferous lobe of left mandible.

posterolateral, also simple (detail, fig. 1A). Pereonites 1–5 with a posterolateral spiniform processes, larger on pereonites 3 and 4, and smaller on the other; pereonite 6 with rounded posterolateral corners, having two very small simple setae. Pereonites 2 and 3 with a very small simple seta on the base of spiniform processes. Pereonite 2, with very small hyposphenia, and pereonite 6, with great genital cone (detail, fig. 1A).

*Pleon*, about as long as last two pereonites together, with five short pleonites, bearing pleopods. Each pleonite expanded posterolaterally by a spiniform process. Pleonites 1–3 with eight lateral and four caudal plumose setae, and six dorsal simple setae. Pleonite 4 with six lateral plumose setae, two plumose and two simple setae on caudal side, and six dorsal simple setae. Pleonite 5 with four lateral and three caudal simple setae, and four dorsal simple setae (details, fig. 1A). Each pleonite with a ventral spine-like process, oriented caudally.

*Pleotelson* equal to the length of the pereonite 6, 1.2 times as long as wide, with lateral swellings in the first half bearing seven simple setae; dorsomedially and at the base of uropod, with three and, respectively, four simple setae; caudally with one pair of long, one pair of small and two pairs of very small simple setae.

*Antennule* (Fig. 1B) about as long as cephalothorax and the first pereonite together. First peduncular article 2.7 times as long as wide, inner side with a median row of about 16 long simple setae and other six situated subdistally; outer side with a median long simple seta and a row of about 13 long simple setae in the distal third; also, groups of three to six small penicillate setae are present proximally, medianly and distally. Article 2, 0.4 times as long as article 1, with about six and 12 long simple setae on the inner and outer distal sides, respectively, and five penicillate setae, distally. Article 3, 0.4 times as long as article 2, with three long simple setae on the inner and three on the outer sides, distally. Article 4 (common) with two penicillate and two simple setae on inner margin. Inner flagellum with three articles, each of them with one penicillate and two to four simple setae; the last article with three simple and one penicillate setae. Outer flagellum with seven articles; first article naked, the articles 2, 3 and 5 bearing an aesthetasc and two to four simple setae; the last article with three long simple and two penicillate setae.

*Antenna* (Fig. 1C) with first peduncle article as long as wide, having an inner dentiform expansion and three subdistal small simple setae. Article 2, the largest, 1.5 times as long as wide, with one small simple seta on mid-inner and outer distal sides; proximally with some rows of small scales; squama large, longer than articles 3 and 4 together, with about 20 unequal simple setae around, the longest seta reaching the first two flagellum articles. Article 3 shortest, with one inner distal long simple seta almost reaching the tip of article 5. Article 4 shorter than the following one, with two penicillate setae. Article 5 with about seven unequal simple setae on the inner side, and three and two penicillate setae, mid-outer and distally, respectively. Flagellum with six articles; article 1 with nine long simple setae on the outer margin and other two, inner, distally; article 2 and 3 with four or five long simple setae, but each of the following two articles with only two simple setae; article 6 with four terminal simple setae.

*Labrum* (Fig. 1D) without special features; distally and laterally with numerous setules.

*Mandibles* (Fig. 1E–G) with three-articled palp (Fig. 1F); article 1 smaller, about 1.5 times as long as wide, with about 16 very long simple setae; article 2 approximately 1.2 times as long as article 1 and about 1.9 times as long as wide, with many small and four long serrated setae; article 3 as long as article 2 but narrower than that, and about three times as long as wide, with more than 25 serrated setae, three of which are very long. Pars incisiva of right mandible (Fig. 1E) with four denticles; setiferous lobe with one simple and four furcate setae; pars molaris well developed. Pars incisiva and lacinia mobilis of the left mandible (Fig. 1G), with four and three denticles, respectively; setiferous lobe with five furcate setae.

*Labium* (Fig. 2A) with about eight or nine very small denticles on the outer margin of basal lobe; palp large, ovate, with long hairs on each side and three robust distal spines.

*Maxilulle* (Fig. 2B) with biarticled palp ended in four unequal serrated setae. Outer endite with fine long hairs on outer margin and 11 stout distal spines, two of them with small denticles; subdistally with one small spine and two serrated setae (detail fig. 2B). Inner endite with five setulose distal setae; outer margin with blunt process and fine distal hairs.

*Maxilla* (Fig. 2C) with outer lobe of movable endite with eight serrated distal setae. Inner lobe of movable endite with a row of six serrated and many curved setae. Outer lobe of fixed endite with three furcate and some serrated setae. Inner lobe of fixed endite with a row of about 30 simple and nine large and robust serrated setae. Inner margin of maxilla with about eight small denticles.

*Maxilliped* (Fig. 2D) coxa very short, with some scales on the lateral corners. Basis large, as a square, with tiny hairs and very small denticles on distal corner of outer margin, and five short simple setae situated innerly, distally. First palp article short and broad, with two proximal small simple setae on the outer margin, one long and two small simple setae on the inner distal side and one simple seta in outer distal corner. Article 2 largest, with about 40 simple setae on the inner margin, many of them very long, and one long simple seta on outer distal corner. Article 3 slightly longer than article 1 and narrower than the previous one, with many simple setae on distal inner margin. Article 4 very small, with six long simple setae, four of them stronger.

*Endite* (Fig. 2E) large, with many different setae (simple, truncate, etc.) and hairs, and one long simple seta on superior margin; inner caudal seta not leaf-shaped. Inner margin with four coupling hooks and a row of 10 stout circumplumose setae; outer margin with many hairs.

*Epignath* (Fig. 2F) large, cup-shaped; distal spine stout, with many setule on both sides, and tiny hairs at the base.

*Cheliped* (Fig. 3A) strong. Basis large, approximately 1.6 times as long as broad, with about 20 unequal simple setae on dorsal margin, one spine and nine simple setae on the last half of ventral side and three simple setae on the lateral surface; exopodite present; last article with four long plumose setae. Merus well-developed, twice as long

as wide, with eight midventral long simple setae and eight on the distoventral margin; other five or six long simple setae are present on inner and outer surface. Carpus, approximately 0.4 times as wide as median length; ventrally and dorsodistally with about 18 and eight simple setae, respectively, and on each lateral surface with eight to

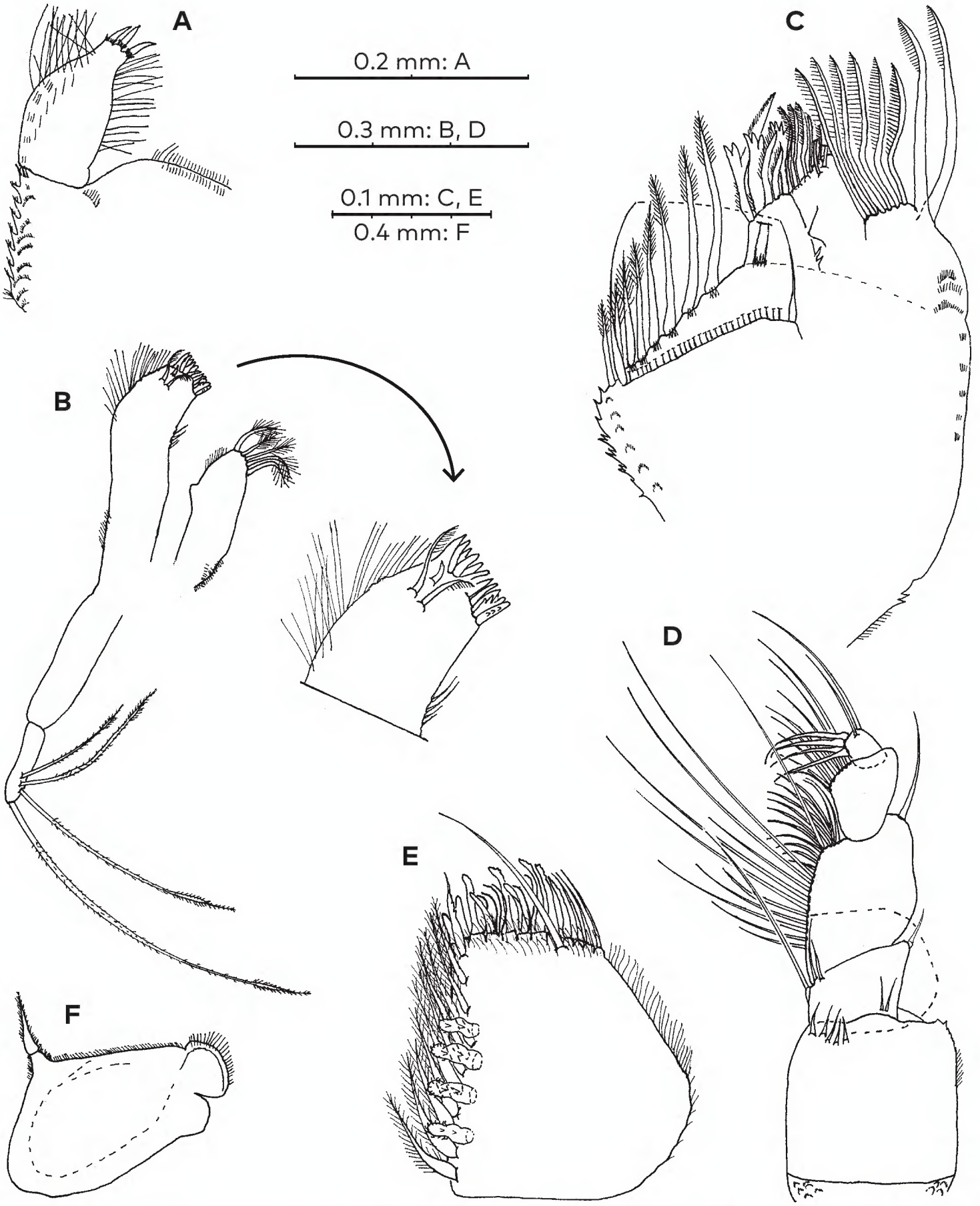


**Figure 2.** *Apseudopsis arguinensis*, female: **A** labium; **B** maxillule; **C** maxilla; **D** maxilliped; **E** maxilliped endite; **F** epignath.

ten simple setae. Propodus, approximately 1.5 time wider than carpus; palm with two dorsal and about six distodorsal simple setae; fixed finger thick at base, with about 11 simple setae around of the distal edge, and other three, smaller, at base; cutting edge with about seven long simple setae near the dactylus articulation, and numerous serrated spinules and setules situated between mentioned setae and claw; claw stout. Dactylus, thinner than the fixed finger, with three long finely serrated setae in distal half; cutting edge with numerous denticles and short apparently serrated setae; claw stout, relatively long, slightly curved.

*Pereopod 1* (Fig. 4A) fossorial, larger than other pereopods. Coxa small, with obvious spiniform prolongation having few simple setae, visible dorsally at the level of first pereonite. Basis thick, two times as long as wide, with about 15 simple setae on the ventral margin (six situated medianly, four in the distal third, and five in the distal corner) and one small spine in ventrodistal corner; dorsally and distodorsally with seven long and five small simple setae; exopodite present; last article with six plumose setae. Ischium short, with five small simple setae in distoventral corner.

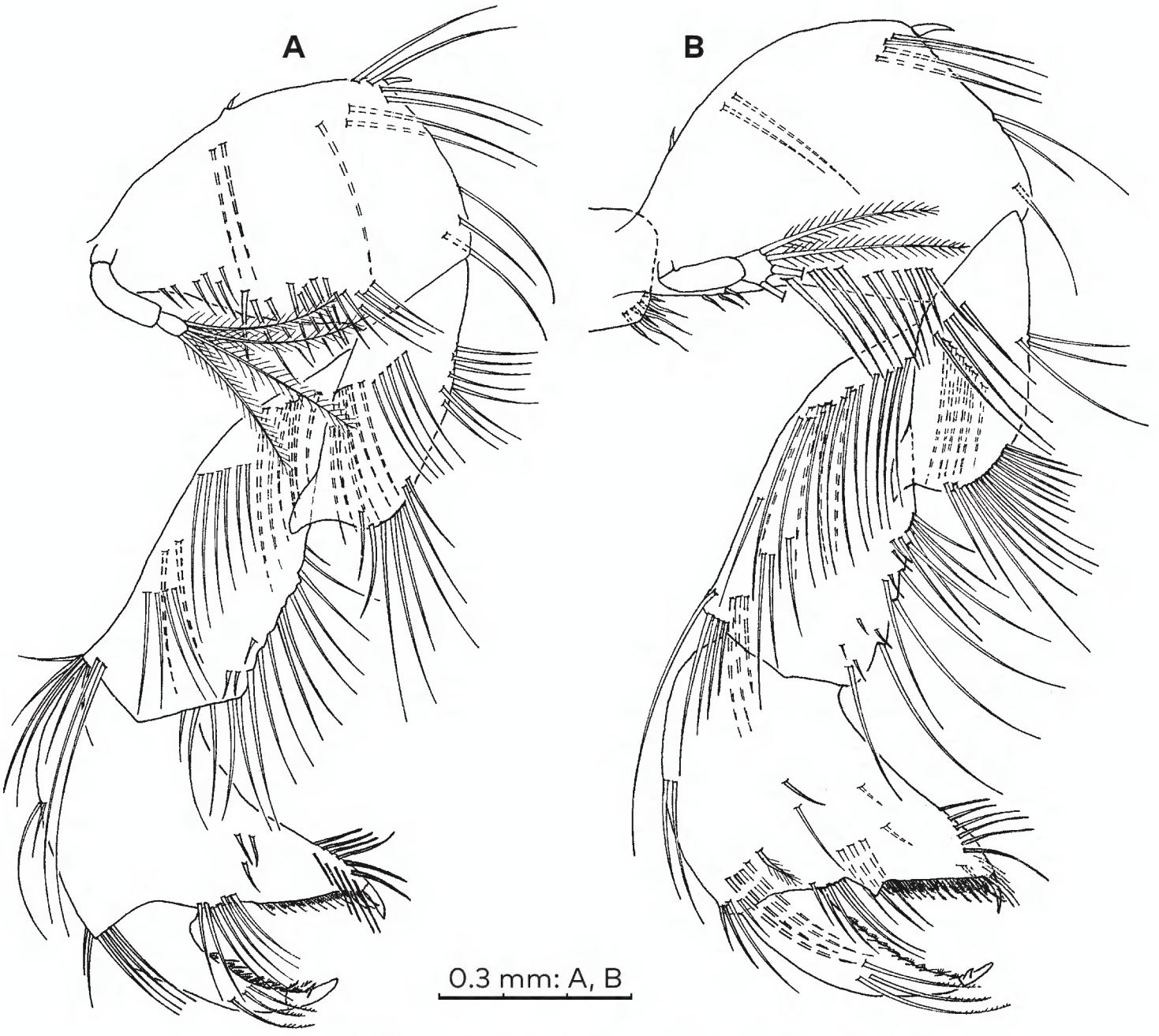


**Figure 3.** *Apseudopsis arguinensis*: **A** female cheliped; **B** male cheliped.

Merus well developed, approximately 0.57 times as long as basis and 1.8 times as long as wide, with about 20 ventral simple setae and one strong ventrodistal spine; lateral surface and distodorsal with 12 long and two very long simple setae, respectively. Carpus slightly shorter than merus and approximately as long as distal width, with about 10 simple setae and two strong spines on ventral side; dorsal and distodorsal margin with about 28 long simple setae (some of them longer than propodus) and one stout spine; a few small setae are present on lateral surface. Propodus, about as long as carpus but narrower than that, with six ventral strong spines alternating with one or two small simple setae; dorsal margin with 10 long simple and one penicillate setae, and two strong spines; one serrate and one small simple setae are present near dactylus articulation, and four small simple setae on lateral surface. Dactylus slightly longer than next spines with one mid-ventral small spine and one distoventral short

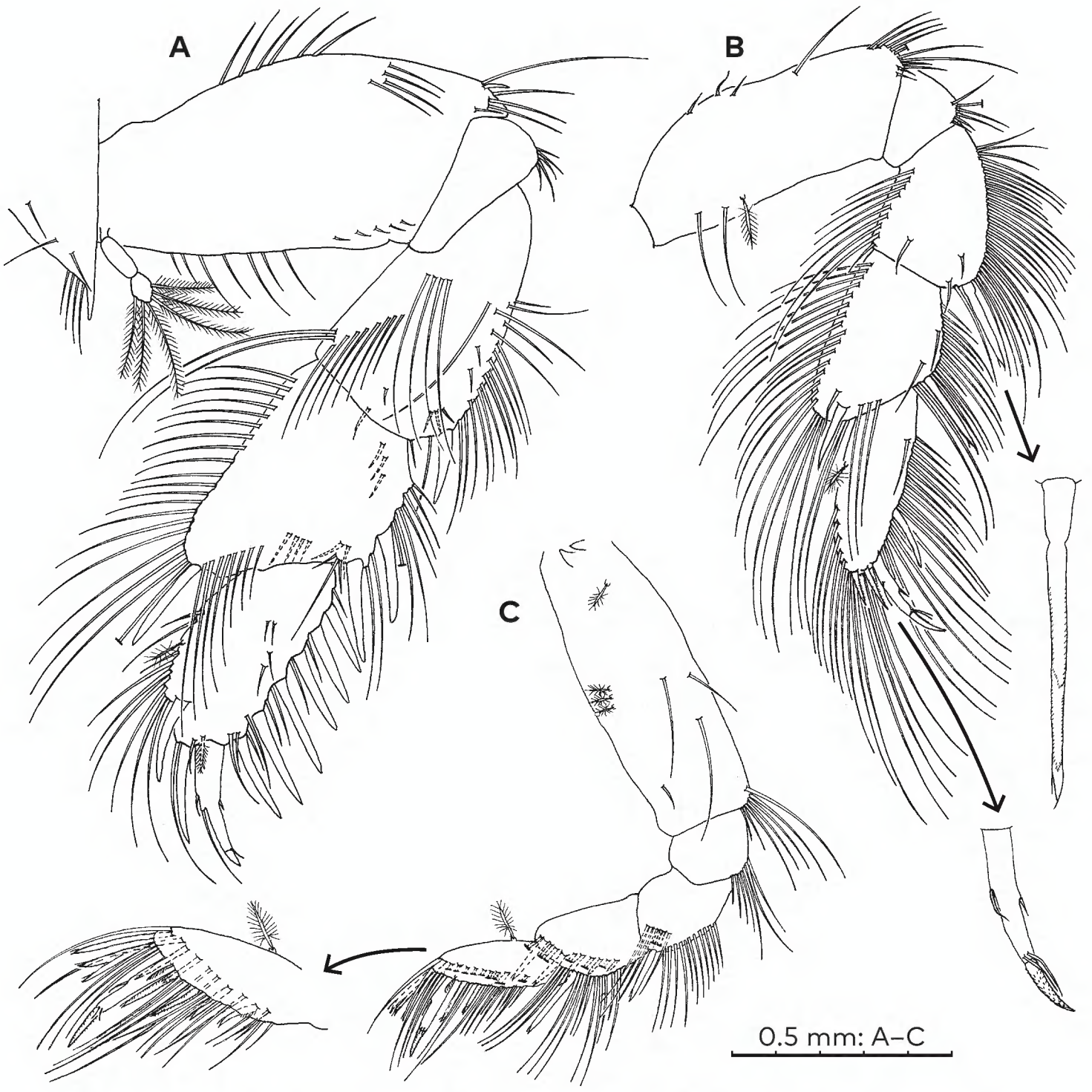


**Figure 4.** *Apseudopsis arguinensis*, female: **A** pereopod 1; **B** pereopod 2; **C** pereopod 3.

seta; mid-dorsally with one small and one long simple seta (exceding unguis length); unguis very small.

*Pereopod 2* (Fig. 4B). Basis 2.4 times as long as wide, with three proximodorsal setae, (one of them penicillate); ventral margin with three proximal, one median and about 11 distal simple setae, some of them very small. Ischium short, with about six ventrodistal simple setae. Merus and carpus (each of them 0.5 times as long as basis) and propodus (slightly longer than merus or carpus) with many long simple setae and one or two spines on each margins, as follows: dorsal and distodorsal sides with about nine setae, 25 setae and one spine and 13 setae and two spines, on each article, respectively; ventral margin with about 30 setae and one spine, 16 setae and one spine, and 18 setae and one spine also on each article. Dactylus thin, with three very small setae, and one small spine (details, fig. 4B); unguis longer than the same of pereopod 1.

*Pereopod 3* (Fig. 4C) smaller than the pereopod 2. Basis 2.6 times as long as wide, with four dorsal penicillate setae, a tuft of seven ventrodistal simple setae and a few lateral long simple setae. Ischium short, with about seven ventrodistal simple setae. Merus, carpus and propodus (the last as long as carpus, but slightly longer than merus,

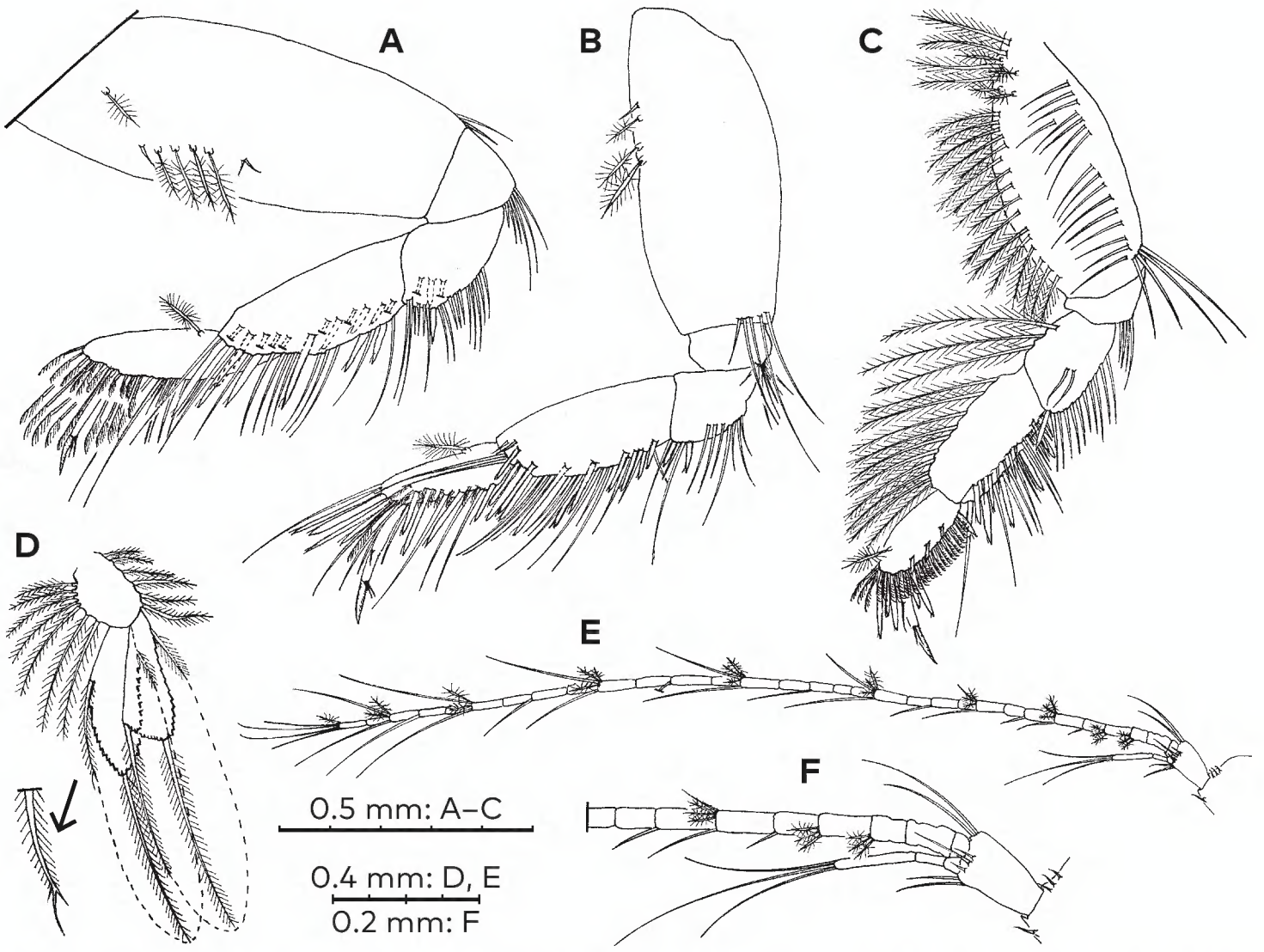


**Figure 5.** *Apseudopsis arguinensis*, female: **A** pereopod 4; **B** pereopod 5; **C** pereopod 6; **D** pleopod 1; **E** uropod; **F** detail of uropod peduncle, exopod and first part of endopod.

all together having approximately the same length with basis) with two dense rows of ventral simple setae and three, six and nine spines, on each articles, respectively. Dactylus thin; unguis slender, similar to the same of pereopod 2.

*Pereopod 4* (Fig. 5A). Basis about 2.5 times as long as broad, with five dorsal penicillate setae and other three very small, simple, and also two ventrodistal simple setae. Ischium short, with six ventrodistal simple setae. Merus, carpus and propodus (the last article being longer than merus but shorter than carpus, all together as long as basis) with two ventral rows of simple setae and spines. Merus about 1.6 times as long as wide, with about 18 simple setae and two spines. Carpus 2.4 times as long as wide, with about 19 simple setae and 10 spines. Propodus with one dorsoproximal penicillate seta, about 20 serrated setae (10 of them longer) and eight simple setae, ventrally; there are no spines (neither in female nor male propodus). Dactylus with two small ventral setae at unguis base; unguis slender.

*Pereopod 5* (Fig. 5B) relatively similar to pereopod 4, excepting the setulation and spinulation. Basis with three penicillate and one small simple seta on dorsal margin, and five ventrodistal long simple setae. Ischium with five ventrodistal simple setae. Merus with 10 simple setae and two spines, ventrally. Carpus with about 14 long and two small simple setae, and 12 spines, ventrally. Propodus with eight unequal simple and nine serrated setae, and eight spines, ventrally. Dactylus and unguis relatively similar to the same of previous pereopod.

*Pereopod 6* (Fig. 5C) differs from the other pereopods by the presence of numerous plumose setae on dorsal margin. Basis with about 20 long plumose and four penicillate setae on dorsal side and about 21 simple setae, ventrally. Ischium short, with four ventrodistal simple setae. Merus with three dorsal plumose setae; ventrally with 10 simple setae and one spine, and two simple setae, on lateral surface. Carpus with 10 dorsal plumose setae, and about 17 ventral simple setae and eight spines. Propodus with about 28 short serrated setae and nine spines, on ventral and ventrodistal margins, respectively, and one dorsal penicillate seta. Dactylus and unguis relatively similar to the same of previous pereopod.

*Pleopods* (Fig. 5D) biramous, in five pairs, alike, with well-developed peduncle; exopodites slightly shorter than endopodites. Pleopod 1 with six outer and seven inner plumose setae on peduncle; exopodite with 23 and endopodite with 25 long plumose setae, around. Pleopod 5 with fewer setae on peduncle, exopodite and endopodite.

*Uropod* (Fig. 5E, F) peduncle 1.63 times as long as wide, with seven distal simple setae. Exopodite with three articles (the last one longer than the first two combined) having three very long simple setae, terminally (see detail, fig. 5F). Endopodite with about 30 articles, most of them with two or three penicillate and one or two simple setae; the last article with one penicillate and four simple setae.

*Males*. Habitus, mouthparts, pereopods, pleopods and uropods relatively similar to those of females, excepting the cheliped, which is stronger; fixed finger with a small proximal prominence, as a tooth, and numerous serrated spinules and setules on the cutting edge (Figs 3B, 6A, B, 7A, B).

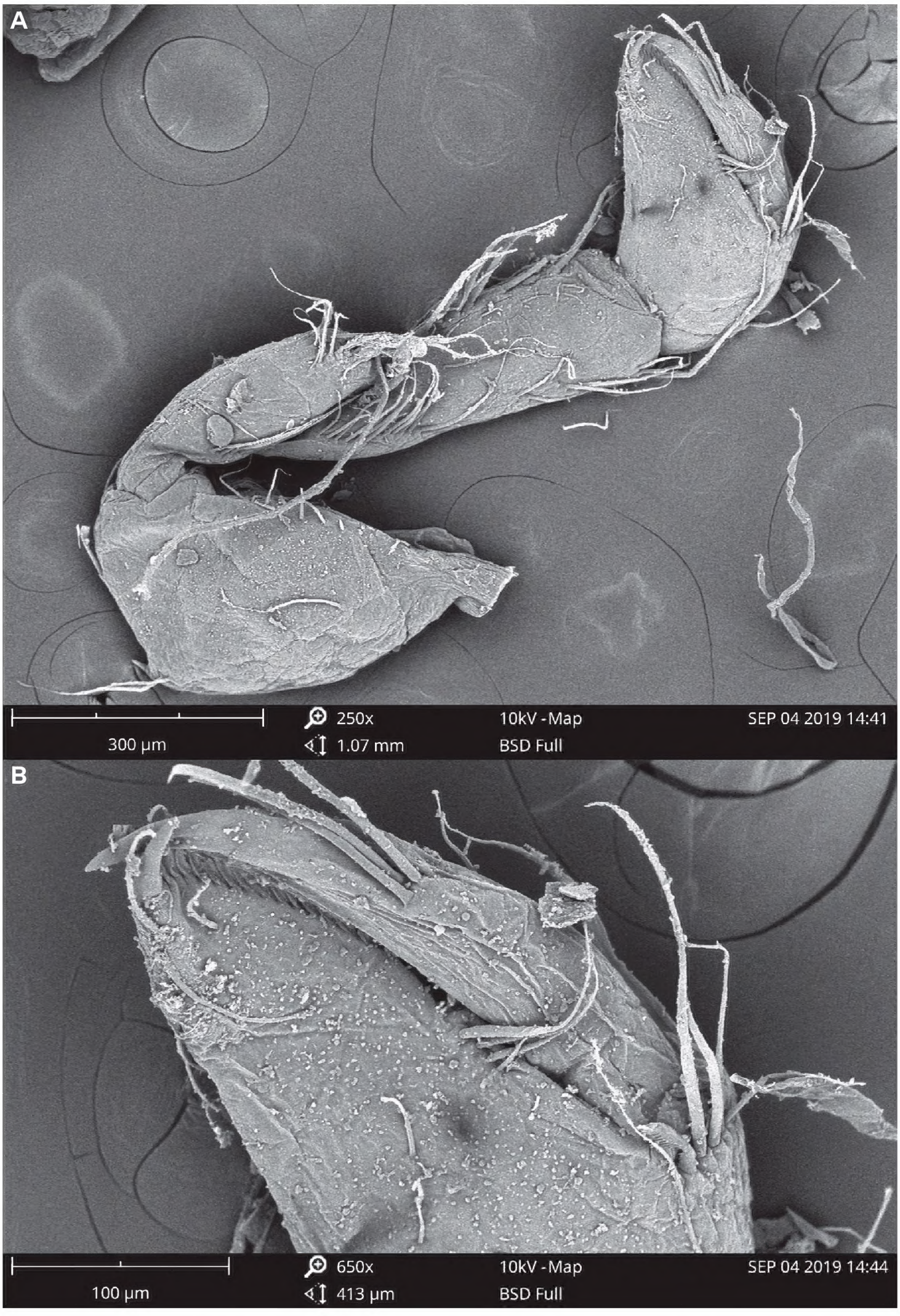


**Figure 6.** SEM images of *Apseudopsis arguinensis*, male cheliped: **A** outer lateral view; **B** fixed finger and dactylus.

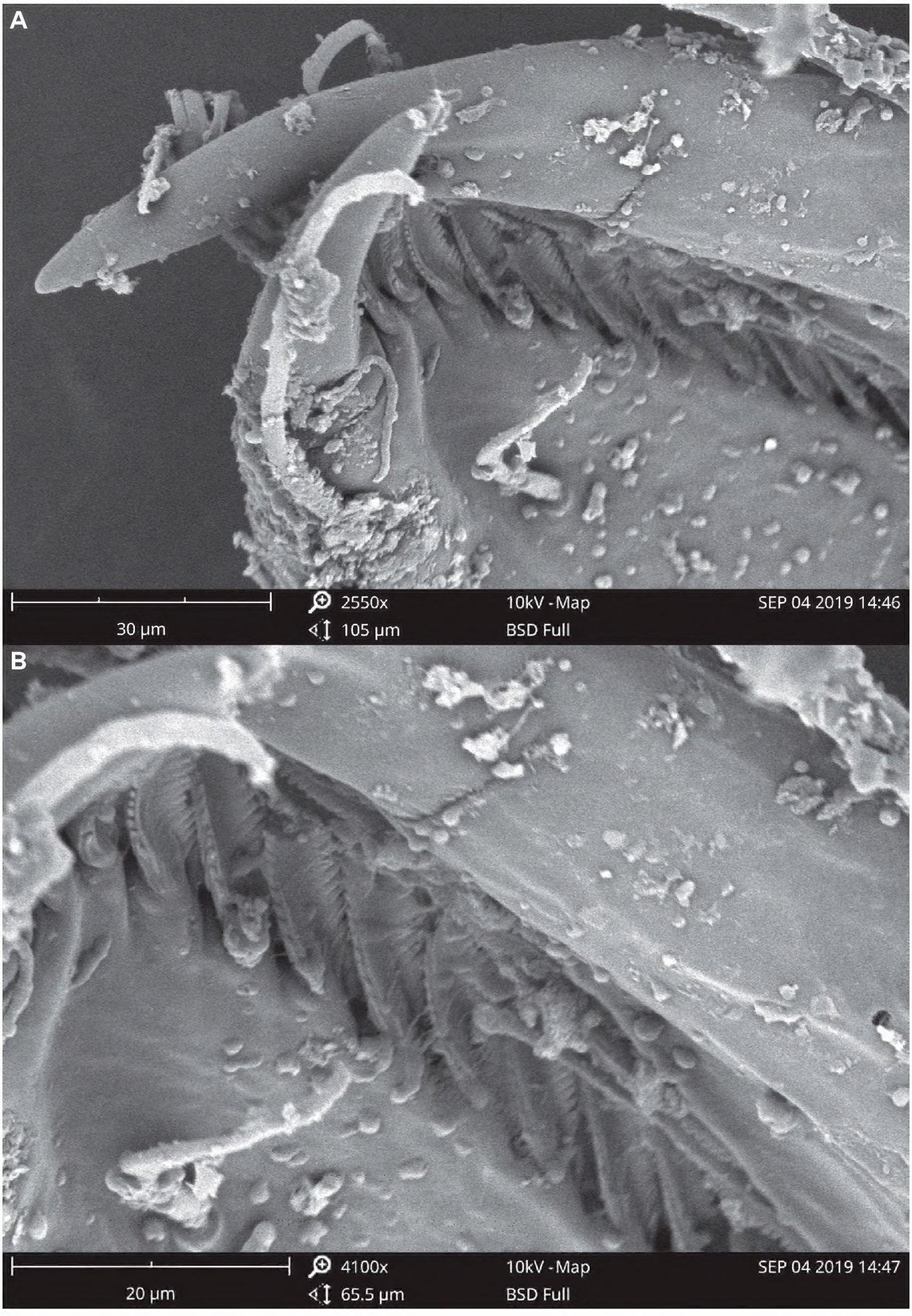


**Figure 7.** SEM images of *Apseudopsis arguinensis*, male cheliped: **A** distal parts of fixed finger and dactylus; **B** detail of fixed finger cutting edge, with serrated spinules.

## Remarks

*Some remarks on the variability.* Based on the observations made on many females (with eggs or oostegites), it was rarely found differences regarding the number of antennule and antenna flagellum articles, in contrast with uropods, where the number of articles of exopodites varies quite often. But, the most numerous differences were noticed at the level of the setae number of some article or appendage parts (antennules, antennae, mandible palp, maxilliped palp, chelipeds, pereopods or pleopods). The same conclusions were reached after the observations made on many juveniles, with the remark that the differences are in close correlations with the body size, being more accentuated in small specimens.

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